

Patent Claims:

- 09465750-021400
1. Structure of optically effective diffraction security elements with a metallic reflection layer, **characterized by** a target-oriented electric code of data by additionally applied [page 8, lines 7-10] beam, grid, bow and/or circularly shaped electrically conductive structures with steep edges towards adjacent non-metallized structures in different planes [DE 197 34 855], the line thickness of the smallest electrically conductive structure which may be examined being less than or equal to 5 mm.
2. Structure of security elements of claim 1, allow examination of security elements, **characterized by** a target-oriented electric code of data by additionally applied [page 8, line 7-10] beam, grid, bow and/or circularly shaped metallized structures with steep edges towards adjacent non-metallized structures in different planes [DE 197 34 855], the line width of the smallest metallized structure which may be examined being less than or equal to 5 mm.
3. Structure of security elements of <sup>claim 1</sup>~~one or more of the preceding claims~~, **characterized by the fact** that different electrically conductive structures [claim 1] possess different electric conductivities.
4. Structure of security elements of <sup>claim 1</sup>~~one or more of the preceding claims~~, **characterized by the fact** that at least two structures within a security element possess different application thicknesses [claim 1].
5. Structure of security elements of <sup>claim 1</sup>~~one or more of the preceding claims~~, **characterized by the fact** that the width of an electrically conductive layer of constant electric conductivity corresponds to the width of at least two electrodes of an examination apparatus.

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- claim 1
6. Structure of security elements of ~~one or more of the preceding claims,~~  
**characterized by the fact** that the distance between two electrically  
conductive structures of the same and/or different electric conductivity  
is at least .1 mm.
7. Structure of security elements of one or more of the preceding claims,  
**characterized by the fact** that the additionally applied electrically  
conductive structures are inks or dyes [page 6, lines 14-22].
8. Apparatus for the capacitive examination of documents with optically  
effective diffraction security elements with a metallic reflection layer,  
**characterized by the fact** that a capacitively operating scanner (4, 33-  
35) the width of which is larger than the largest width of a document  
[DE 197 34 855] examines electrically conductive structures [claim 1]  
arranged within metallized security elements (37) by means of a  
plurality of transmitting electrodes (5) arranged in one or more rows in  
side by side relationship and with a receiving electrode (6) extending  
along the transmitting electrodes (5) on the same side as the  
document to be examined [see description of Fig. 1 as well as Fig. 1-  
10, 13-15] and evaluates them by electronic energizing and evaluation  
circuits arranged in the scanner (4, 33-35) for comparing the signal  
pattern of the document to be examined with corresponding reference  
signal patterns.
9. Apparatus of claim 8, **characterized by the fact** that at least two  
adjacent electrodes are arranged electrically connected.
10. Apparatus of claim 8 ~~or 9~~, **characterized by the fact** that electronic  
energizing circuit consists of a current source, a multiplexer (10), an  
oscillator (11) for providing energy for the transmitting electrodes (5)  
and an oscillator (12) for energizing the multiplexer (10).

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11. Apparatus of <sup>claim 8</sup> ~~one or more of claims 8 to 10~~, characterized by the fact that the electronic evaluation circuit consists of a current source, an amplifier (13), a demodulator (14), a comparator (15), a micro-processor (16) with memory as well as filters for the suppression of extraneous and interference signals.

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12. Apparatus of <sup>claim 8</sup> ~~one or more of claims 8 to 11~~, characterized by the fact that the smallest distance between two transmitting electrodes (5) is smaller than .5 mm.

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13. Apparatus of <sup>claim 8</sup> ~~one or more of claims 8 to 12~~, characterized by the fact that the distance between a transmitting electrode (5) and the receiving electrode (6) is at least .5 mm.

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14. Apparatus of <sup>claim 8</sup> ~~one or more of the preceding claims 8 to 13~~, characterized by the fact that the apparatus is provided with a biasing device which guides the document to be examined parallel to the transmitting and receiving electrodes, preferably biases against the scanner.

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15. Apparatus of <sup>claim 8</sup> ~~one or more of the preceding claims 8 to 14~~, characterized by the fact that the shafts of the document transport rollers are connected to mass by sliding contacts.

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16. Apparatus of <sup>claim 8</sup> ~~one or more of claims 8 to 14~~, characterized by the fact that the apparatus is arranged in high speed document processing machines.

17. Apparatus of <sup>claim 8</sup> ~~one or more of claims 8 to 16~~, characterized by the fact that the apparatus is arranged in manual apparatus.

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18. Apparatus for use of optically effective diffraction security elements with a metallic reflection layer in documents with a structure according to one or more of claims 1 to 7, as well as use of an apparatus according to one of more of claims 8 to 17, **characterized by the fact** that electrically conductive structures are arranged in such a manner in respect of size, shape, number, hue and spacing among each other on a document to be examined
- that at least one of the electrically conductive structures may be recognized by a group A of persons with the scanner (33) structured as a hand-held apparatus;
  - that at least two of the electrically conductive structures may be recognized by a smaller group B of persons with a scanner (34) installed in a high speed processing machine and equipped with software which is different from the software provided for the group A of persons;
  - that at least three of the electrically conductive structures may be recognized by a very small defined group C of persons with a scanner (34) installed in a high speed processing machine (35) and equipped with software which is different from the software provided for the groups A and B of persons, and
  - that the electrically conductive structures constitute codes which are visually perceptible to persons of group A, and to persons of group B visually and by decoding by software, and to persons of group C primarily by software not available to persons of groups A and B.